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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/815,886 | 03/22/2001 | Victor Krasnov | FRNT.4.US | 7371 |

21861 7590 11/24/2003

JANAH & ASSOCIATES A PROFESSIONAL CORP
650 DELANCEY STREET
SUITE 106
SAN FRANCISCO, CA 941072001

| EXAMINER |
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MERCADO, JULIAN A

| ART UNIT | PAPER NUMBER |
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1745

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/815,886

Applicant(s)

KRASNOV ET AL.

Examiner

Julian A. Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 10-19 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9 is/are allowed.
- 6) ☐ Claim(s) 20,22-27,29 and 30 is/are rejected.
- 7) ☒ Claim(s) 21 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Remarks

This Office Action is responsive to applicant's amendment filed September 20, 2003.

The rejection of claims 1-4 and 9 under 35 U.S.C. 102(b) based on Cheu et al. (U.S. Pat. 5,670,272) has been withdrawn.

The rejection of claims 5 and 6 under 35 U.S.C. 103(a) based on Cheu et al. and Goebel et al. (U.S. Pat. 4,565,753) has been withdrawn.

The rejection of claim 7 under 35 U.S.C. 103(a) based on Cheu et al. and Baker. (U.S. Pat. 3,844,841) has been withdrawn.

The rejection of claim 8 under 35 U.S.C. 103(a) based Cheu et al. and Bates (U.S. Pat. 5,612,152) has been withdrawn.

Election/Restrictions

Applicant's election with traverse of Group I, claims 1-9 in Paper No. 10 is acknowledged. The traversal is on the ground(s) that the method claims (of Group II) contain limitations which are similar to the apparatus claims (of Group I). This is not found persuasive because as set forth in the prior Office Action, Groups I and II are distinct in that the product of Group I can be made by a process that is materially different from that recited in Group II. Additionally, as Group I and Group II have acquired a separate status in the art based on their different classification, restriction for examination purposes as indicated is proper as the search required for Group I is not required for Group II.

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The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 20, 22, 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheu et al. (U.S. Pat. 5,670,272).

The examiner notes that the prior 35 U.S.C. 102(b) rejection of claims 1-4 and 9 based on Cheu et al. has been withdrawn in that the scope of claims 1-4 and 9 as currently amended recites "a plurality of conducting lines".

However, the scope of independent claim 20 recites "one or more conducting lines". Similarly, independent claim 26 recites "a pattern of conducting lines" with said lines present as "one or more", as further defined in dependent claim 27. Thus, the prior rejection based on Cheu et al. is applicable towards new independent claims 20 and 26 in that Cheu et al. is maintained to teach a cathode current collector [60] of nickel or copper which reads on the claimed "one or more" conducting lines. (Figure 2, col. 3 line 49-67, also applies to dependent claim 22) In Cheu et al., the pattern of the one or more lines is horizontally disposed as seen in the Figure. (applies to dependent claim 27)

Claims 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Greatbatch et al. (U.S. Pat. 3,969,142).

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Regarding independent claim 26, Greatbatch et al. teaches a substrate [52] or [60], a cathode [34] having a surface on the substrate, the cathode having a current collector comprising a pattern of conducting lines [36] on the an opposing surface, an anode [42], and an electrolyte such as lithium iodine between the cathode and the anode. (col. 8 line 41-col. 9 line 18) Note that the electrolyte, lithium iodine, is specifically recited to form at each interface between cathode [34] and anode [42]. To this extent, the examiner notes that a fair reading of applicant's disclosure appears to disclose the electrolyte (such as lithium phosphorus oxynitride) as a solid material, however, the scope of the present claims are silent as to the composition or physical state of the claimed electrolyte.

As to dependent claim 27, the conducting lines [36] are horizontally disposed as seen in Figure 17.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cheu et al. as applied to claims 20, 22, 26 and 27 above, in view of Goebel et al. (U.S. Pat. 4,565,753)

The teachings of Cheu et al. are discussed above.

Cheu et al. does not explicitly teach the conducting lines to comprise elongated prongs extending from a base prong. However, Goebel teaches an elongated rectangular strip having elongated prongs such as found in its mesh structure and with a disclosed open texture or contact

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area of approximately 50%. (col. 3 line 32-44) Thus, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Cheu et al.'s invention by employing elongated prongs and contacting less than 80% of the cathode surface area. The motivation for such a modification would be to uniformize current conductive paths across the cathode surface.

Claims 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheu et al. as applied to claims 20, 22, 26 and 27 above, in view of Baker. (U.S. Pat. 3,844,841)

The teachings of Cheu et al. are discussed above.

Cheu et al. does not explicitly teach the substrate to comprise mica. However, Baker teaches a substrate [48] to comprise mica along its outer faces. (Figure 7, col. 3 line 62-66) Thus, the skilled artisan would have found obvious to modify Cheu et al.'s invention by having the substrate comprise mica along its exposed surfaces. The motivation for such a modification would be to electrically and thermally insulate the substrate from the outer battery housing.

Claims 25 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheu et al. as applied to claims 20, 22, 26 and 27 above, in view of Bates (U.S. Pat. 5,612,152)

The teachings of Cheu et al. are discussed above.

Cheu et al. does not explicitly teach the cathode to comprise lithium cobalt oxide. However, Bates teaches lithium cobalt oxide LiCoO_2 for the cathode material.

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(col. 5 line 7-29) Absent of unexpected results, it would not require undue experimentation for the skilled artisan to employ lithium cobalt oxide for Cheu et al.'s cathode material as lithium cobalt oxide is an art-recognized equivalent for the disclosed vanadium oxide V_2O_5 .

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greatbatch et al. in view of Stockel. (U.S. Pat. 4,309,494)

The teachings of Greatbatch et al. are discussed above.

Greatbatch et al. does not explicitly teach the substrate to comprise mica. However, Stockel teaches that mica is a known additive as a filler in the formation of a battery separator. (col. 3 line 51-53) As set forth above under the 35 U.S.C. 102(b) rejection, in Greatbatch et al. the separator [60] also meets the limitation of the claimed substrate, as the cathode [34] has a surface on the separator. Thus, the skilled artisan would find obvious to employ mica in Greatbatch et al.'s invention for reasons such as introducing the desired level of porosity in the separator. (Stockel, col. 3 line 44-47)

Response to Arguments

As the prior art rejection of claims 1-9 based on Cheu et al. have been withdrawn, applicant's arguments with respect to these claims are deemed moot.

Arguments against Baker et al. and Bates et al. appear to be directed to these references failing to remedy alleged differences between Cheu et al. and the present claims. These arguments are also deemed moot in view of the rejection of claims 1-9 based on Cheu et al. having been withdrawn. The examiner notes that no additional arguments against these

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secondary references were submitted by applicant so as to preclude the new ground of rejection(s) based on these references as set forth in this Office Action.

Allowable Subject Matter

Claims 1-9 are allowed.

The following is an examiner's statement of reasons for allowance: the prior art of record and to the examiner's knowledge do not teach or render obvious at least to the skilled artisan the instant invention regarding a cathode current collector comprising a plurality of conducting lines that contact the cathode surface and having spacings therebetween, with an electrolyte at least partially extending through the spacings to contact the cathode.

Claims 21 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims would be allowable consistent with the reasons set forth in the preceding paragraph for claims 1-9.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Allowable subject matter has been indicated in this Office Action. Applicant is reminded that a formal cancellation of non-elected and withdrawn claims 10-19 is required if applicant intends to place the entire application in condition for allowance.

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian A. Mercado whose telephone number is (703) 305-0511. The examiner can normally be reached on Monday through Friday.

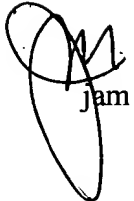
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



jam



Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700